

Solid State-2

Density, Bragg's Equation, Crystal Defects and Properties of solids

Questions from Previous Exams

- If Z is the number of atoms in the unit cell that represents the closest packing sequence $ABCABCABC\dots$ the number of tetrahedral voids in the unit cell is equal to** (AIPMT 2005)
1. Z 2. $2Z$ 3. $\frac{Z}{2}$ 4. $\frac{Z}{4}$
- In a face – centered cubic unit cell, edge length is** (DPMT 2005)
1. $\frac{4}{\sqrt{3}}r$ 2. $\frac{4}{\sqrt{2}}r$ 3. $2r$ 4. $\frac{\sqrt{3}}{2}r$
- The Ca^{2+} and F^{-} are located in CaF_2 crystal respectively at face – centered cubic lattice points and in** (AIIMS 2006)
1. Tetrahedral voids
2. Half of tetrahedral voids
3. Octahedral voids
4. Half of Octahedral voids
- The number of atoms contained in one face-centered cubic unit cell of monatomic substance is** (PMT 2006)
1. 1 2. 2 3. 4 4. 3
- If NaCl is doped with 10^{-4} mol % of $SrCl_2$, the concentration of cation vacancies will be ($N_A = 6.023 \times 10^{23}$)** (CBSE 2007)
1. $6.02 \times 10^{16} \text{ mol}^{-1}$ 2. $6.02 \times 10^{17} \text{ mol}^{-1}$ 3. $6.02 \times 10^{14} \text{ mol}^{-1}$ 4. $6.02 \times 10^{15} \text{ mol}^{-1}$
- In a solid lattice, the cation has left a lattice site and is located at an interstitial position. The lattice defect is** (BHU 2008)

1. Interstitial defect 2. Vacancy defect 3. Frenkel defect 4. Schottky defect
7. **A particular solid is very hard and has a high melting point. In solid state, it is a non – conductor and its melt is a conductor of electricity. Classify the solid** (CMC 2008)
1. Metallic 2. Molecular
3. Network 4. Ionic 5. Amorphous
8. **Percentage of free space in a body – centered cubic unit cell is** (CBSE 2008)
1. 34 % 2. 28 % 3. 30 % 4. 32 %
9. **Which of the following statements is not correct** (CBSE 2008)
1. The number of carbon atoms in a unit cell of diamond is 4
2. The number of Bravais lattices in which a crystal can be categorized is 14
3. The fraction of the total volume occupied by the atoms in a primitive cell is 0.48
4. Molecular solids are generally volatile.
10. **In a stands for the edge length of the cubic systems: simple cubic, body-centered cubic and face-centered cubic, then the ratio of radii of the spheres in these systems will be respectively** (CBSE 2008)
1. $\frac{1}{2}a : \frac{\sqrt{3}}{2}a : \frac{\sqrt{2}}{2}a$ 2. $1a : \sqrt{3}a : \sqrt{2}a$ 3. $\frac{1}{2}a : \frac{\sqrt{3}}{4}a : \frac{1}{2\sqrt{2}}a$ 4. $\frac{1}{2}a : \sqrt{3}a : \frac{1}{\sqrt{2}}a$

KEY

- 1)2 2)2 3)1 4)3 5)2 6)3 7)4 8)4 9)4 10)3